Electro-Voice®

S-60/S-60T

Two-Way Speaker System

- Two-way compact system
- Constant-directivity system for uniform coverage
- 6.5-inch woofer
- One-inch tweeter with dispersion-controlling Direktor™
- Automatically resetting tweeter-protection circuit
- Optional 60-W transformer with selectable taps (S-60T)
- Available in paintable white or black

SPECIFICATIONS

Frequency Response, 1 Watt/ 1 Meter on Axis, Swept Sine-Wave Input, Half-Space Anechoic Environment, ±3 dB (see Figure 1):
60-18,000 Hz

Low-Frequency 3-dB-Down Point:
60 Hz

Usable Low-Frequency Limit (10-dB-down point):
47 Hz

Half-Space Reference Efficiency:
0.6%

Long-Term Average Power-Handling Capacity per EIA Standard RS-426A (see Power-Handling Capacity section):
100 watts

Maximum Woofer Acoustic Output:
0.6 watts

Sensitivity (SPL at 1 meter, 1 watt input, anechoic environment, band-limited pink-noise signal, 300-2,000 Hz):
88 dB

Dispersion Angle Included by 6-dB-Down Points on Polar Responses, Horizontal and Vertical Planes, Indicated One-Third-Octave Bands of Pink Noise (see Figure 2):
- **500-1,000 Hz:** 170° ±30°
- **1,000-10,000 Hz:** 120° ±20°
- **10,000-20,000 Hz:** 70° ±30°

Directivity Factor R_θ (Q), 800-16,000 Hz Median (see Figure 4):
7.3 (+14.9, −4.5)

Directivity Index D_I, 800-16,000 Hz Median (see Figure 4):
8.6 dB +4.8/−4.1 dB

Distortion, 0.1 Full Power Input (see Figure 5),
- **Second Harmonic,**
  - **100 Hz:** 8%
  - **1,000 Hz:** <1%
  - **10,000 Hz:** <1%
- **Third Harmonic,**
  - **100 Hz:** 1.4%
  - **1,000 Hz:** <1%
  - **10,000 Hz:** <1%

Distortion, 0.01 Full Power Input (see Figure 6),
- **Second Harmonic,**
  - **100 Hz:** 7%
  - **1,000 Hz:** <1%
  - **10,000 Hz:** <1%
- **Third Harmonic,**
  - **100 Hz:** <1%
  - **1,000 Hz:** <1%
  - **10,000 Hz:** <1%

Transducer Complement,
- **High Frequency:** 2.5-cm (1-in.) tweeter with 12.5-cm (5-in.) Direktor™
- **Low Frequency:** 16.5-cm (6.5-in.) woofer

Box Tuning Frequency:
60 Hz

Crossover Frequency:
2,500 Hz

Crossover Slope:
12 dB per octave

Impedance,
- **S-60,**
  - **Nominal:** 8 ohms
  - **Minimum:** 5 ohms
- **S-60T:** See Table 1

Input Connections,
- **S-60:** ¼-inch phone jack with parallel 5-way binding post
- **S-60T:** 5-way binding post with weatherproof cover

Materials,
- **Enclosure and Baffle Board:** Injection-molded plastic, black or white
- **Grille:** Punched metal, powder coated, black or white

Mounting:
EV S-60MB mounting bracket or OmniMount® Series 75 mounting hardware, black or white[1]

Dimensions,
- **Height:** 35.0 cm (13.8 in.)
- **Width:** 22.0 cm (8.7 in.)
- **Depth:** 21.1 cm (8.4 in.)

1 OmniMount is a registered trademark of OmniMount Systems, Inc

S-60 SPECIFICATIONS GRAPHICS

FIGURE 1 — Axial Frequency Response

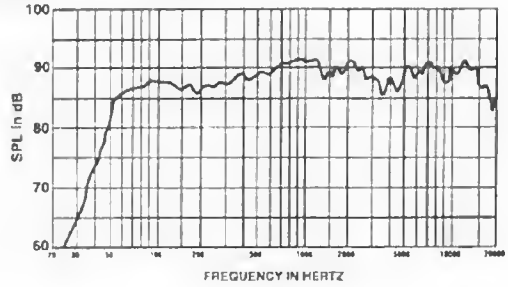


FIGURE 2 — Polar Response

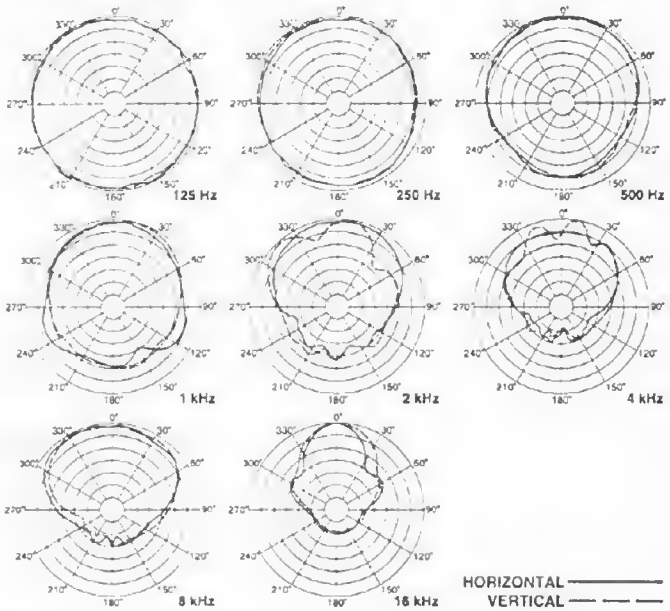


FIGURE 3 — Beamwidth vs. Frequency
(whole space anechoic environment)

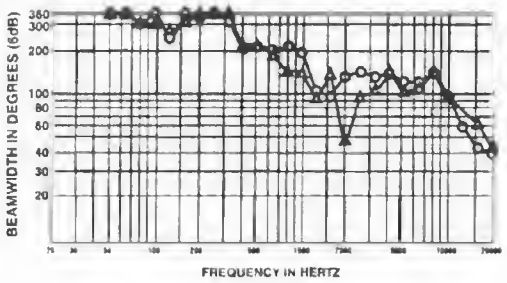


FIGURE 4 — Directivity vs. Frequency
(whole space anechoic environment)

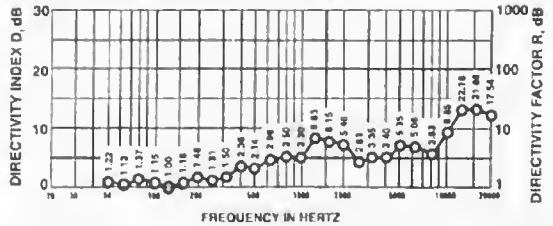


FIGURE 5 — Harmonic Distortion, 0.01 Rated Power Input (1 watt)

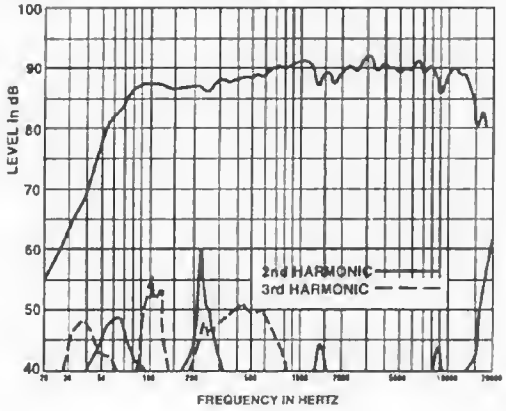


FIGURE 6 — Harmonic Distortion, 0.1 Rated Power Input (10 watts)

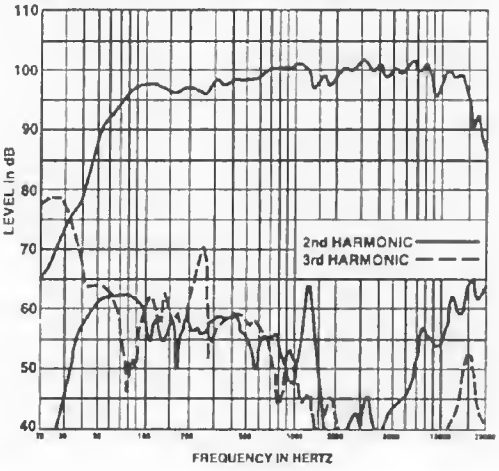


FIGURE 7 — Two Examples of S-60 Mounting Using the OmniMount® Series 75 Support System[1]

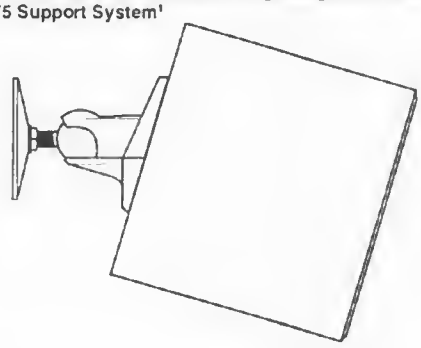


FIGURE 8 — Dimensions

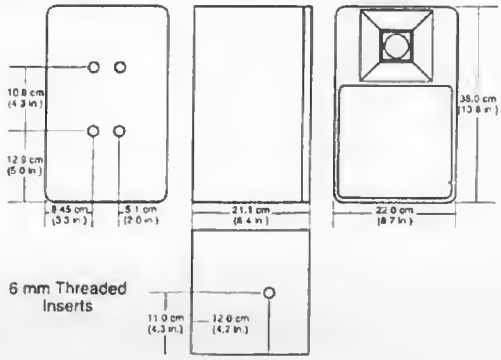
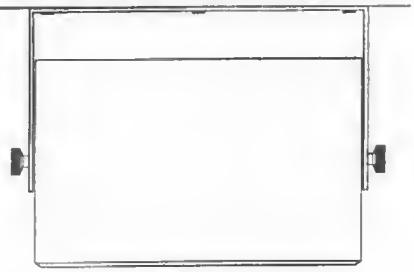


FIGURE 9 — Using the S-60MB with the S-60



Power Tap	IMPEDANCE 100-volt	70-volt
60 W	167 Ω	83 Ω
30 W	333 Ω	167 Ω
15 W	667 Ω	333 Ω
7.5 W	1,350 Ω	667 Ω
3.8 W	2,700 Ω	1,350 Ω
1.9 W	5,400 Ω	2,700 Ω

TABLE 1

1. OmniMount® is a registered trademark of OmniMount® Systems, Inc.

Net Weight,
S-60:
7.0 kg (15.4 lb)
S-60T:
8.4 kg (18.4 lb)
Shipping Weight,
S-60:
9.5 kg (20.9 lb)
S-60T:
10.9 kg (23.9 lb)

DESCRIPTION

The Electro-Voice S-60/S-60T are compact, two-way, constant-directivity speaker systems for sound reinforcement and monitoring. The small size, high sensitivity and high power-handling capacity of the S-60/S-60T make them an excellent choice for use in studios, clubs, bars, theaters or other applications. The combination of optimal crossover frequency and high-frequency, dispersion-controlling Direktor™ ensures uniform audience coverage throughout, eliminating the problems of "hot spots" and "dead zones" that might occur at certain frequencies with other two-way speaker systems.

The low-frequency section is a 16.5-cm (6.5-in.) direct-radiating woofer installed in an optimally vented enclosure. This results in exceptionally extended bass response and high efficiency in a very small cabinet.

Both drivers feature low-leakage magnet designs, and the woofer is also screened to permit use close to video monitors. For very critical video-monitoring applications, a minimum distance of approximately 10 cm (4 in.) is recommended between the edge of the loudspeaker and the edge of the CRT.

The enclosure is constructed from high-impact ABS plastic which has been specially treated to allow the enclosure to be painted using commonly available finishes. The system can be mounted using OmniMount® Series 75 mounting hardware or the EV S-60MB mounting bracket.

CONSTANT-DIRECTIVITY SPEAKER SYSTEM

The crossover frequency and speaker-component geometries have been carefully selected so that the directional characteristics of the woofer and Direktor™ match at the crossover frequency (approximately 120 degrees circular coverage patterns for each) to create a special system type—the constant-directivity system. At higher frequencies, the horizontal and vertical coverage pattern remains essentially constant. Response within the 120° x 120° rated coverage angle is uniform, which means dependable audience coverage without "hot spots" or "dead zones" at certain frequencies. The 120° x 120° dispersion characteristic permits this small system to be used either horizontally or vertically, allowing greater flexibility in setup or installation. The controlled directivity of the high- and low-frequency transducers also eliminates response irregularities caused by diffraction off enclosure edges. This, combined with an essentially flat on-axis response, produces a total acoustic power output that is uniform with frequency.

FREQUENCY RESPONSE

The S-60/S-60T's axial frequency response was measured in Electro-Voice's large anechoic chamber at a distance of 10 feet with a swept sine-wave input of four volts. No additional equalization was used. Figure 1 has been averaged and corrected for 1 watt at 1 meter.

DIRECTIVITY

The directional characteristics of the S-60/S-60T were measured in Electro-Voice's large anechoic chamber. The test signal was one-third-octave filtered pink noise at the frequencies indicated. A full spherical measurement system was used, which is compatible with the AcoustaCADD™ computer-aided design program. All directional information was measured at 20 feet.

Figure 2 illustrates the horizontal and vertical polar responses.

Figure 3 shows the horizontal and vertical beamwidths. Beamwidth is the angle at which the horizontal and vertical polar responses have decreased in level by 6 dB when compared to the axial frequency response.

Figure 4 illustrates the total directivity of the S-60/S-60T. The directivity index, D_i, is calculated using the formula $D_i = 10 \log R_\theta$.

POWER-HANDLING CAPACITY

Electro-Voice components and systems are manufactured to exacting standards to ensure reliability in continuous use in arduous real-life conditions. Besides utilizing industry-standard power tests, extreme in-house power tests which push the performance boundaries of the loudspeakers are also performed for an extra measure of reliability. The S-60/S-60T are rated as per the ANSI/EIA 426-A Loudspeaker Power Rating, Full Range Test, which uses a shaped random-noise signal to simulate typical music to test the mechanical and thermal capabilities of the loudspeakers. Specifically, the S-60/S-60T passes the ANSI/EIA 426-A power test with the following test parameters:

P_{EIMAX}: 400 watts total
Test Voltages: 21.7 volts rms
43.4 volts peak
R_{SR} (1.15 x R_E): 4.7 ohms

SUSPENDING THE S-60/S-60T

The S-60/S-60T is fitted with six M6 threaded inserts and can be suspended as follows:

1. S-60MB is a universal U-bracket designed to allow the suspension of the S-60 at any angle and orientation from the wall or ceiling (see Figure 9). Full instructions are included with the S-60MB.
2. OmniMount® Series 75 support system. Four M6 threaded inserts are located in the rear panel to allow use of the OmniMount® Series 75 support system. M6 hardware is provided. A safety chain should be used to ensure safe operation. Full instructions can be obtained from:

   OmniMount® Systems, Inc.
   1501 W. 17th St.
   Tempe, AZ 85281
   Tel: 602/829-8000
   Fax: 602/756-9000

WARNING: IT IS THE RESPONSIBILITY OF THE INSTALLER TO ENSURE THAT THE MOUNTING SURFACE HAS SUFFICIENT RIGIDITY TO SUPPORT THE S-60 AND THAT THE MOUNTING BRACKET IS CORRECTLY FITTED TO THE SURFACE AND TO THE S-60.

TRANSFORMER SETTINGS (S-60T)

A transformer and power selector switch are installed in the rear of the enclosure. The level of the S-60T may be adjusted by changing the switch setting using a screwdriver. Clockwise increase the power. Since the same switch and transformer are used for either the 100-volt or 70-volt line, the power setting depends upon the amplifier output that is used, 100-volt or 70-volt.

CAUTION: When connected to a 100-volt line, do not use the switch setting marked "DO NOT USE," as this may result in excessive power driving the S-60T, or excessive distortion.

CONSTRUCTION

The enclosure is constructed from injection-molded ABS plastic. The S-60/S-60T is supplied in an all-black or all-white finish and can be painted if required.

Both the baffle board and the enclosure have been specially treated to enhance the adhesion of paints. The S-60 has been tested with several commercially available paints with success. Electro-Voice cannot, however, guarantee that all commercially available paints will be satisfactory. It is, therefore, recommended that a small area should be tested with the paint in order to ensure that there are no adverse effects and that the paint has sufficient adhesion.

Care should be taken not to get paint onto the woofer cone or the tweeter screen.

TWEETER-PROTECTION CIRCUIT

The S-60/S-60T crossover is fitted with an automatically resetting tweeter-protection device. This new design permits short-term transients to pass, but protects the tweeter from long-term power extremes that would normally destroy the tweeter.

ARCHITECTS' AND ENGINEERS' SPECIFICATIONS

The loudspeaker system shall be a constant-directivity, two-way system. The speaker system shall contain a 16.5-cm (6.5-in.) low-frequency loudspeaker and a 2.5-cm (1-in.) high-frequency tweeter with dispersion-controlling Direktor™. The S-60T shall include a 60-watt line transformer installed in the vented enclosure. The line transformer shall have power taps for 60 W, 30 W, 15 W, 7.5 W, 3.8 W and 1.9 W. The power taps shall be switch-selectable. The dividing network crossover frequency shall be 2,500 Hz. The loudspeaker system shall meet the following performance criteria: power handling, 100 watts per EIA RS-426A; frequency response, ±3 dB from 70 to 18,000 Hz; pressure sensitivity, 88 dB SPL at 1 watt/1 meter band-limited pink noise in an anechoic chamber; impedance, 8 ohms nominal, 5 ohms minimum. The enclosure shall be two-piece construction with a particle-board cabinet and a molded plastic baffle. The unit shall be 35.0 cm (13.8 in.) high, 22.0 cm (8.7 in.) wide and 21.1 cm (8.4 in.) deep. The loudspeaker system shall be the Electro-Voice model S-60/S-60T.

UNIFORM LIMITED WARRANTY

Electro-Voice products are guaranteed against malfunction due to defects in materials or workmanship for a specified period, as noted in the individual product-line statement(s) below, or in the individual product data sheet or owner's manual, beginning with the date of original purchase. If such malfunction occurs during the specified period, the product will be repaired or replaced (at our option) without charge. The product will be returned to the customer prepaid. **Exclusions and Limitations:** The Limited Warranty does not apply to: (a) exterior finish or appearance; (b) certain specific items described in the individual product-line statement(s) below, or in the individual product data sheet or owner's manual; (c) malfunction resulting from use or operation of the product other than as specified in the product data sheet or owner's manual; (d) malfunction resulting from misuse or abuse of the product; or (e) malfunction occurring at any time after repairs have been made to the product by anyone other than Electro-Voice or any of its authorized service representatives. **Obtaining Warranty Service:** To obtain warranty service, a customer must deliver the product, prepaid, to Electro-Voice or any of its authorized service representatives together with proof of purchase of the product in the form of a bill of sale or receipted invoice. A list of authorized service representatives is available from Electro-Voice at 600 Cecil Street, Buchanan, MI 49107 (616/695-6831 or 800/234-6831). **Incidental and Consequential Damages Excluded:** Product repair or replacement and return to the customer are the only remedies provided to the customer. Electro-Voice shall not be liable for any incidental or consequential damages including, without limitation, injury to persons or property or loss of use. Some states do not allow the exclusion or limitation of incidental or consequential damages so the above limitation or exclusion may not apply to you. **Other Rights:** This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Electro-Voice Speakers and Speaker Systems are guaranteed against malfunction due to defects in materials or workmanship for a period of five (5) years from the date of original purchase. The Limited Warranty does not apply to burned voice coils or malfunctions such as cone and/or coil damage resulting from improperly designed enclosures. Electro-Voice active electronics associated with the speaker systems are guaranteed for three (3) years from the date of original purchase. Additional details are included in the Uniform Limited Warranty statement.

Service and repair address for this product: Electro-Voice, Inc., 600 Cecil Street, Buchanan, Michigan 49107 (616/695-6831 or 800/234-6831).

Specifications subject to change without notice.

ELECTRO-VOICE a MARK IV company **600 Cecil Street, Buchanan, Michigan 49107**
MANUFACTURING PLANTS AT ■ BUCHANAN, MI ■ NEWPORT, TN ■ SEVIERVILLE, TN ■ OKLAHOMA CITY, OK ■ GANANOQUE, ONT

Part Number 532411 — 9515